Introductions to Canada - 2003
Report to the NRSP-6 Technical Committee
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Using information provided from NRSP-6 by Jesse Schartner, germplasm provided to cooperators in Canada during 2003 is shown in the following table. In a follow-up questionnaire responses were received from five of the seven cooperators, and additional information on their work with the germplasm is provided below.

Cooperator	Institution	Order	Purpose
Qin Chen	AAFC Lethbridge Research Centre Alberta	1 order/4 units	Breeding
Yvan Pelletier (Cathy Clark)	AAFC Potato Research Centre NB	2 orders/62 units	Development of potato parental lines resistant to insects
Warren Coleman	AAFC Potato Research Centre NB	2 orders/119 units 1 order/50 units	Dormancy research Drought resistance in wild *Solanum* species
Larry Kawchuk	AAFC Lethbridge research Centre	1 order/2 units	S. blb for breeding work
Agnes Murphy	AAFC Potato Research Centre NB	1 order/4 units	Select LBR bulk
Benoit Rancourt	AAFC Centre do R et D en horticulture St. Jean-sur-Richelieu QC	1 order/16 units	Entomology breeding project
Pierre Turcotte	Centre de Recherche les Buissons Pointe-aux-Outardes QC	1 order/72 units	LBR clones for breeding

Qin Chen
AAFC, Lethbridge Research Centre

Over the past five years, 36 accessions have been received representing 12 species.

All these materials have been screened for late blight, CPB and blackleg resistance. It was found

that 4 species *S. bulbocastanum, S. pinnatisectum, S. cardiophyllum* and *S. polyadenium* were resistant to late blight. Two species *S. pinnatisectum* and *S. polyadenium* were resistant to both late blight and CPB. One species *S. bulbocastanum* was resistant to blackleg.

The 4 species *S. bulbocastanum, S. pinnatisectum, S. cardiophyllum* and *S. polyadenium* were used to study genetics of late blight and CPB and also used to develop adapted germplasm with resistance to late blight and CPB.

At present time, about 300 somatic hybrids have been produced from the combination of 4x *S. tuberosum* + *S. pinnatisectum*, and *S. tuberosum* + *S. cardiophyllum* through protoplast fusion. Resistance to late blight and CPB has been transferred from *S. pinnatisectum* into 4x S. tuberosum background through protoplast fusion.

Interspecific crossability and cytogenetics of sexual progenies of *S. pinnatisectum* and *S. cardiophyllum* were also studied. It was found that there were large differences in the cross-compatibility among the genotypes and accessions from these two species. It could appear that selection of genotypes is a key for successful interspecific hybridization when using Mexican wild diploid species as a source of economic important traits.

Publications

Chen, Q., Kawchuk, L. M., Lynch, D. R., Goettel, M. S., and Fujimoto, D. K. 2003. Identification of late blight, Colorado potato beetle and blackleg resistance in three Mexican and two South American wild 2x (1EBN) *Solanum* species. Amer. J. Potato Res. 80: 9-19.

Qin Chen, D. Lynch, H.W. (Bud) Platt, H.Y. Li, Y. Shi, L. Rakosy-Tican, H.J. Li and R. Theme. 2004. Interspecific crossability and cytogenetic analysis of sexual progenies of Mexican wild diploid 1EBN species *Solanum pinnatisectum* and *S. cardiophyllum.* Amer. J. Potato Res. 81: 159-168.

Chen, Q., S.k. Sun, Q. Ye, S. McCuine, E. Huff andH.B. Zhang. 2004. Construction of two BAC libraries from the wild Mexican diploid potato, *Solanum pinnatisectum* and identification of clones near the late blight and Colorado potato beetle resistance loci. Theor. Appl. Genet. 108:1002-1009.

Chen, Q., Y.Z. Shi, H.Y. Li, D. Beasley, D. Lynch, M. Goettel and L. Kawchuk. 2004. Protoplast fusion for transferring late blight and Colorado potato beetle resistance genes from Mexican wild *Solanum* species into cultivated potato by. 2004 World Congress on in vitro Biology Abstract Issue. San Francisco, California. May 22-26.2004. P2000.

Yvan Pelletier
AAFC, Potato Research Centre, Fredericton

We regularly request seeds from Sturgeon Bay for our wok. We use something like 17 different species for resistance to the Colorado potato beetle, aphids, and fleabeetle. Some of that work is supported by the Canadian industry and some is part of a larger international project with France

and Argentina. Two species have been used in the past in crosses to improve potato germplasm for resistance to the Colorado potato beetle. Progress has been made in the area of germplasm development, understanding of the mode of resistance to insects, knowledge of the genetics of insect resistance and of more efficient selection processes. We are not yet at a stage where economic impact can be determined.

Last publication
Yvan Pelletier, and Catherine Clark. 2004. Use of reciprocal grafts to elucidate mode of resistance to Colorado potato beetle (*Leptinotarsa decemlineata* (Say)) and potato aphid (*Macrosiphum euphorbiae* Thomas) in six wild *Solanum* species. Amer. J. Potato Res. In press.

Warren Coleman
AAFC, Potato Research Centre, Fredericton

Fifty accessions from 6 *Solanum* species were received at the PRC during 2003 for drought screening assessment. In addition, we received 119 accessions (17 species) for dormancy evaluation.

Material was planted and minitubers obtained. They are currently being prepared for initial screening under greenhouse conditions.

The genebank is very important in supporting our research program.

Larry Kawchuk
AAFC, Lethbridge Research Centre

801 accessions of a wide cross section of species were received last year to be screened for disease reactions. This work has not yet commenced.

Agnes Murphy
AAFC, Potato Research Centre

250 seeds of Late Blight R gene-free resistant selections were received.

The TPS sown in the breeding greenhouse at PRC, Fredericton and tubers produced from 234 plants. A single tuber from each sedling was planted at the Benton Ridge Potato Breeding Substation, May 2004. Samples will be collected at harvest and assessed for late blight resistance winter/spring 2004/05.

Appreciate the prompt replies and delivery of germplasm whenever it has been requested.